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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/656,130	09/08/2003	Makoto Higashikawa	00839.000419.1	8647

5514 7590 03/06/2006

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EXAMINER

ARANCIBIA, MAUREEN GRAMAGLIA

ART UNIT PAPER NUMBER

1763

DATE MAILED: 03/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/656,130

Applicant(s)

HIGASHIKAWA ET AL.

Examiner

Maureen G. Arancibia

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 December 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 December 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☒ Certified copies of the priority documents have been received in Application No. 09/261,499.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Information Disclosure Statement

1. The listing of references in the specification, specifically the listing of "Applied Physics-related joint lecture meetings" in Paragraph 11 of the Specification, is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609.04(a) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,652,029 to Itoh (from Applicant's IDS) in view of Japanese Patent Application Publication 09-256160 to Takaki et al. (from Applicant's IDS). The following rejection refers to the English Machine Translation (EMT) of Takagi et al.

Itoh teaches an apparatus for forming a thin film on a substrate, comprising a plurality of bar shaped electrodes 400, 401, 402, 403, 404 opposed to a substrate 115 in a vacuum chamber 101, arranged such that they are perpendicular to a normal line of said substrate and their intervals x_1 , x_2 , x_3 , x_4 , x_5 to said substrate are all different (Figure 6), and a high frequency power source 108 for causing glow discharge. (Column 3, Line 43-48; Column 8, Lines 48-60)

The apparatus taught by Itoh would be inherently capable of forming a microcrystalline silicon series thin film in a deposition process on the substrate 115, as recited in the preamble of Claim 1. This rejection is based on the fact the apparatus structure taught above has the inherent capability of being used in the manner intended by the Applicant. When a rejection is based on inherency, a rejection under 35 U.S.C. 102 or U.S.C. 103 is appropriate. (See *In re Fitzgerald* 205 USPQ 594 or MPEP 2112).

Itoh does not expressly teach that the high frequency power can be in the range of 50 to 550 MHz.

Takaki et al. teaches that the high frequency power supplied to a plurality of bar shaped electrodes 204 can be in the range of 30 to 600 MHz. (EMT, Paragraphs 46-47)

It would have been obvious to one of ordinary skill in the art to modify the apparatus taught by Itoh to have the high frequency power be in the range of 30 to 600 MHz (which encompasses the claimed range), as taught by Takaki et al. The motivation for making such a modification, as taught by Takaki et al. (EMT, Paragraphs 33, 34, and 46-48), would have been to combine the high deposition rate made possible by the high frequency power with the uniformity of deposition made possible by the arrangement of the electrodes.

In regards to Claims 2 and 3, Itoh teaches that the plurality of bar shaped electrodes are arranged such that they are parallel to each other and perpendicular to a transportation direction of the substrate. (Figure 6; Column 5, Line 66 - Column 6, Line 2)

In regards to Claims 4 and 5, Itoh teaches that the plurality of bar shaped electrodes are arranged such that their intervals are periodically changed relative to a transportation direction of the substrate, with the intervals to the substrate wider in an upper side of a transportation direction (x_1 , x_2 , x_3) and narrower in a down side of a transportation direction (x_4 , x_5). (Figure 6; Column 3, Line 43-48; Column 8, Lines 48-60)

Double Patenting

5. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

6. Claims 1-5 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over Claims 25 and 26 of U.S. Patent 6,076,481 to Yamagami et al. ('481) in view of Itoh, or in the alternative over Claims 6 and 7 of U.S. Patent 6,065,425 to Takaki et al. ('425) in view of Itoh, or in the alternative over Claims 5 and 12 of U.S. Patent 6,279,504 to Takaki et al. ('504) in view of Itoh.

Claims 25 and 26 of '481, Claims 6 and 7 of '425, and Claims 5 and 12 of '504 each recite all of the limitations of Claims 1-5 of the instant application, except that the intervals of the electrodes to the substrate are all different or in part different, or specifically that the intervals are periodically changed relative to a transportation direction of the substrate, with the intervals to the substrate wider in an upper side of a transportation direction and narrower in a down side of a transportation direction.

Itoh teaches an apparatus for forming a thin film on a substrate, comprising a plurality of bar shaped electrodes 400, 401, 402, 403, 404 opposed to a substrate 115 in a vacuum chamber 101, arranged such that they are perpendicular to a normal line of said substrate and their intervals x_1 , x_2 , x_3 , x_4 , x_5 to said substrate are all different (Figure 6). (Column 3, Line 43-48; Column 8, Lines 48-60) Itoh teaches that the plurality of bar shaped electrodes are arranged such that their intervals are periodically

changed relative to a transportation direction of the substrate, with the intervals to the substrate wider in an upper side of a transportation direction (x_1 , x_2 , x_3) and narrower in a down side of a transportation direction (x_4 , x_5). (Figure 6; Column 3, Line 43-48; Column 8, Lines 48-60)

It would have been obvious to one of ordinary skill in the art to modify each of the apparatuses recited in Claims 25 and 26 of '481, Claims 6 and 7 of '425, and Claims 5 and 12 of '504 to vary the intervals of the electrodes to the substrate in the manner taught by Itoh. The motivation for making such a modification, as taught by Itoh (Column 8, Line 65 - Column 9, Line 16), would have been to optimize the distribution in hardness of the deposited film as the substrate is moved past the electrodes.

Response to Arguments

7. The Examiner notes Applicant's showing that U.S. Patent Nos. 6,076,481 to Yamagami et al.; 6,152,071 to Akiyama et al.; 6,065,425 to Takaki et al.; and 6,279,504 to Takaki et al. are disqualified under 35 U.S.C. § 103(c). The rejection under 35 U.S.C. 103(a) alternatively over each of these references in view of Itoh has been withdrawn.

8. Applicant's remaining arguments filed 20 December 2005 have been fully considered but they are not persuasive.

In response to Applicant's argument that Itoh teaches a high frequency power outside the claimed range, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Applicant further argues that the range in frequency of 30 to 600 MHz taught by Takaki et al. in combination with Itoh does not render obvious the claimed range of 50 to 550 MHz, because the claimed range gives unexpectedly superior results. This argument is not convincing. It has been held that "[A] prior art reference that discloses a range encompassing a somewhat narrower claimed range is sufficient to establish a *prima facie* case of obviousness." *In re Peterson*, 315 F.3d 1325, 1330, 65 USPQ2d 1379, 1382-83 (Fed. Cir. 2003). Moreover, Takaki et al. further discloses a smaller, preferred range of 60 to 300 MHz (EMT, Paragraph 46), which falls *within* Applicant's claimed range.

The Examiner argues that Applicant's arguments and the comparative examples presented in the Specification are insufficient to overcome the obviousness rejection over Itoh in view of Takaki et al. The Examiner points to MPEP § 716.02, which states, "Any differences between the claimed invention and the prior art may be expected to result in some differences in properties. The issue is *whether the properties differ to such an extent that the difference is really unexpected*. *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986)." (emphasis added) In this case, one of ordinary skill in the art would *expect* changes in the properties of the film formed in a deposition process using the apparatus taught by the combination of Itoh and Takaki et al., based on the selected operating frequency. It would have been well within the purview of one of ordinary skill in the art to select an appropriate operating frequency, based on the process requirements. Moreover, one of ordinary skill in the art, in applying the

teachings of Takaki et al., would have taken note of the disclosed *preferred* range of 60 to 300 MHz.

Applicant also argues that it would not have been obvious to modify any of Claims 25 and 26 of '481, Claims 6 and 7 of '425, and Claims 5 and 12 of '504 in view of the teachings of Itoh as applied in the obviousness-type double patenting rejections, since making the intervals of the electrodes to the substrate all different or in part different produces unexpected superior results.

The Examiner argues that Applicant's arguments and the comparative examples presented in the Specification are also insufficient to overcome the obviousness-type double patenting rejection. Itoh provides a strong motivation for combining the teaching of Itoh of the intervals of the electrodes to the substrate being all different with the teachings of any of Claims 25 and 26 of '481, Claims 6 and 7 of '425, and Claims 5 and 12 of '504: to optimize the distribution in hardness of the deposited film as the substrate is moved past the electrodes. (Column 8, Line 65 - Column 9, Line 16) Applicant does not address this motivation. Moreover, Itoh provides a teaching of *expected* variations in the deposited film if the intervals of the electrodes to the substrate are all different.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Maureen G. Arancibia whose telephone number is (571) 272-1219. The examiner can normally be reached on core hours of 10-5, Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571) 272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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